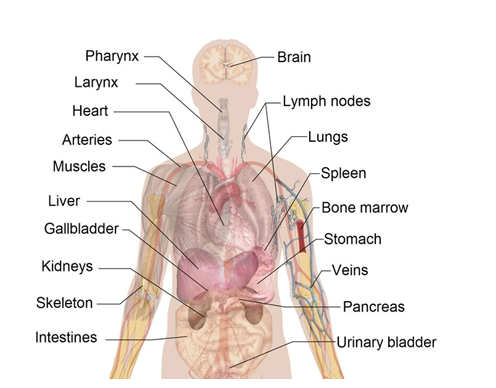
**An Original Culminating Activity**

**Grade 5: Human Organ Systems**

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EDU 1301

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**Part A – Student Handout**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_





Book of Wonders

Now that you are a specialist in human organ systems, the Swansea Publishing Co. wants to hire you to write a book about an organ system of your choice. You will present your book to parents and students during our school’s book fair.

Your book will be part of a series of **pop-up books** about the human body. Swansea Publishing needs you to provide specific information about your organ system, following a specific template.

**Your book will have to address these specific points:**

* Clearly state which organ system you are teaching us about in your book
* Describe the parts of your system and what they do
* Describe the role of your system (why do we need this system?)
* Explain how your system interacts with at least one other organ system
* Mention at least one disease or one problem that can affect your system and what you can do to keep it healthy
* Discuss a habit humans have or something in their environment and how it positively or negatively affects your chosen organ system
* Have at least 4 pop-up pages in your book (not all pages need to be pop-up pages)
* One of the pop-ups will act as a model that will demonstrate how components of your system work and interact with other components

**These points are based on the following expectations from the Ontario Science Curriculum:**

1. Relating science and technology to society and the environment
   1. assess the effects of social and environmental factors on human health, and propose ways in which individuals can reduce the harmful effects of these factors and take advantage of those that are beneficial
2. Developing investigation and communication skills

**2.3** design and build a model to demonstrate how organs or components of body systems in the human body work and interact with other components

**2.4** use appropriate science and technology vocabulary, including *circulation*, *respiration*, *digestion*, *organs*, and *nutrients*, in oral and written communication

**2.5** use a variety of forms to communicate with different audiences and for a variety of purposes

1. Understanding basic concepts
   1. identify major systems in the human body and describe their roles and interrelationships
   2. identify interrelationships between body systems
   3. identify common diseases and the organs and/or body systems that they affect

**You will be assessed in various ways:**

* **Peer assessment**: a classmate will look at your draft and complete the Peer Assessment Rubric
* **Teacher draft assessment**: Your teacher will look at your draft and at the completed Peer Assessment Rubric and give you feedback
* **Self-assessment**: Once your pop-up book is done, you will complete the Self-Assessment Rubric
* **Teacher final assessment**: The teacher will use the Pop-Up Book Rubric to assess the completed assignment

**Steps to create your book of wonders:**

* Choose an organ system
* Use books, internet and other classroom resources to collect information about your chosen organ system
* Write a draft copy of your book
* Ask a classmate to read and assess your draft copy (use the Peer Assessment Rubric). Change/adjust your draft as needed.
* Design your pop-up book. Decide which pop-up features you are going to use on which pages of your book. Decide on illustrations.
* Once your classmate has approved your draft and you have designed your book, show your draft to your teacher
* When your draft has been approved by your teacher, you can start creating your pop-up book
* Your unbelievable, amazing pop-up book is completed!

Draft due date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Pop-up book due date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Please use the checklist on the next page as a guide**

**while you are creating your pop-up book.**

**Pop-Up Book Checklist**

Your book will be assessed using these criteria:

**Draft**

* Your draft has all the necessary content
* A classmate assessed your draft and completed the Peer Assessment Rubric
* You have assessed another student’s draft and completed the Peer Assessment Rubric
* You have clearly decided on the types of pop-up and the illustrations you are going to use

**Content**

Your book:

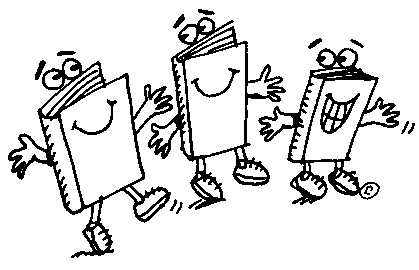
* Has a cover page with a title and author’s name (you!)
* Clearly states which organ system you are teaching us about
* Describes the parts of your system and what they do
* Describes the role of your system (why do we need this system?)
* Explains how your system interacts with at least one other organ system
* Mentions at least one disease or one problem that can affect your system and what you can do to keep it healthy
* Discusses a habit humans have or something in their environment and how it positively or negatively affects your chosen organ system
* Has a reference page with a list of the resources you used (books, websites, other)

Self-assessment

* You have completed a self-assessment and handed it in with your final copy

**Appearance, Pop-Up and Art**

* Neatness
* Accurate spelling and grammar use
* The cover page is eye-catching
* There are at least 4 pop-up pages in your book
* Your pop-ups are varied (you did not use the same pop-up mechanism repeatedly)
* One of the pop-ups acts as a model that demonstrates how components of your system work and interact with other components
* The pop-ups are carefully made and work as intended
* Creativity and originality



**Part B – Notes to Teacher**

Unit Overview

|  |  |
| --- | --- |
| Lesson 1 | Introduction to the unit: Human Organ Systems  KWL chart: Get students to share what they already know on the topic and any question they have relating to the topic. |
| Lesson 2 | Introduction to the nervous system  In groups, students go through 6 stations and try various experiments relating to their nervous system (optical illusions, depth perception, reaction time, temperature perception, 2-point discrimination, Stroop test). |
| Lesson 3 | Nervous system  Explore the parts of the nervous system, how they work together, and what their roles are. Demonstrate by playing a game where students are parts of the nervous system, communicating through impulses (hand squeezing). |
| Lesson 4 | Introduction to the digestive system  Show students a 9 meter long string, representing the average length of an adult digestive system. In groups, students draw and label what they already know about the parts of the digestive system. Afterwards, we complete a game on SMARTboard Notebook labelling parts of the digestive system correctly. |
| Lesson 5 | Digestive system  Jigsaw activity: In groups, students become familiar with information relating to an organ of the digestive system that is provided to them. They develop an original presentation to teach their classmates about their organ. For example, students could create a skit, a rap, a newscast, or a dance. After presentations, the teacher will help reinforce key concepts. |
| Lesson 6 | Introduction to the cardiovascular system  Students learn how to take their pulse, and take it after conducting various teacher-led activities (at rest, running, rope skipping, etc.). Students then graph their results to visualize what happened to their heart rate during the activities. |
| Lesson 7 | Cardiovascular system  Discuss results of the heart rate activity, and try to explain our observations. Present the major parts of the circulatory system (heart, arteries, capillaries, veins, blood). Do a relay in class to demonstrate the route that blood takes through the body and what it intakes and gets rid of along the way. |
| Lesson 8 | Introduction to the respiratory system  Using plastic bottles, balloons, tape and elastic bands, students will build a working model of the respiratory system. |
| Lesson 9 | Respiratory system  Using images and virtual activities on SMARTboard Notebook, students will associate parts of their model with parts of the respiratory system. This is also an opportunity to discuss smoking and its effects on the respiratory system. |
| Lesson 10 | Introduction to the culminating task  Teacher will read/display pop-up books in the classroom. Students are introduced to their culminating task: creating their own pop-up book about an organ system. |
| Lesson 11 | Mini-lessons on the musculoskeletal system and the urinary system with illustrations on a Power Point presentation. |
| Lesson 12-21 | Students research background information on their organ system and design their pop-up book. Activity on how to research information. |
| Book fair | Students share their finished pop-up books with schoolmates and parents. |

Implementation plan

*Expectations from the Ontario science curriculum addressed in the culminating activity*

1. Relating science and technology to society and the environment
   1. assess the effects of social and environmental factors on human health, and propose ways in which individuals can reduce the harmful effects of these factors and take advantage of those that are beneficial
2. Developing investigation and communication skills

**2.3** design and build a model to demonstrate how organs or components of body systems in the human body work and interact with other components

**2.4** use appropriate science and technology vocabulary, including *circulation*, *respiration*, *digestion*, *organs*, and *nutrients*, in oral and written communication

**2.5** use a variety of forms to communicate with different audiences and for a variety of purposes

1. Understanding basic concepts
   1. identify major systems in the human body and describe their roles and interrelationships

**3.3** identify interrelationships between body systems

**3.4** identify common diseases and the organs and/or body systems that they affect

*Please note that this culminating activity also meets expectations from the Ontario Language and Art curricula.*

*Day-by-Day Plan for the Culminating Activity*

|  |  |  |  |
| --- | --- | --- | --- |
| **Time** | **Activity** | **Resources** | **Assessment\*** |
| One 50-minutes period or equivalent | Introduction to the culminating task  Read a pop-up book to students.  Distribute the student handout and read with students. Answer questions related to the project. Ask students to choose an organ system. | - Pop-up book (Example: *The Baboon’s Bottom* written by Keith Faulkner; illustrated by Jonathan Lambert)-Student handout |  |
| Five 50-minutes periods or equivalent | Students are provided with time in class to do research on their organ system and write a draft copy of their book.  Students who are done their draft copy must get a peer to evaluate it.  Once they have obtained a peer evaluation, they must submit their draft and their peer evaluation sheet to the teacher for approval. | -Books and handouts about various organ systems  -Peer evaluation sheets  -Rubric (for teacher use)  -Paper  -Pencils/erasers | -Peer assessment  -Teacher assessment (formative) |
| Five 50-minutes periods or equivalent | Mini-lesson by the teacher on how to make a variety of pop-up patterns.  Once their draft has been approved by the teacher, students work on their final copy of the pop-up book.  Once their book is finished, students have to complete a self-assessment and hand it in with their book. | -Models of pop-up pages pre-made by the teacher to use as demonstrators  -Instructions on how to make a variety of pop-up patterns  -Self-assessment sheets  -Paper  -Construction paper  -Scissors  -Glue sticks/tape  -Staplers/staples  -Colour markers | -Self-assessment  -Teacher assessment (summative) |
| 2 hours, after school | School-wide Book Fair  Students and parents are invited to visit the school and view books created by students as part of a larger celebration of books and of learning | -Students’ pop-up books |  |

*\*See appendices A, B and C for assessment resources*

Prior knowledge and skills required by students

Students should have an understanding of what organ systems are and of the role of major human organ systems. They should be able to name main components of major human organ systems and to explain how various organ systems work together. Students should be familiar with some of the social and environmental factors that affect human health (for example: smoking, sun tanning) and with ways to keep their organ systems healthy.

Students should be able to use appropriate vocabulary when writing about organ systems. More generally, they should be able to extract the information they need from their readings and they should be able to communicate their knowledge in writing.

Students should also have fine motor skills to write, cut and draw.

*Adapted in part from the curriculum guide*

Accommodations

For students with reading and writing exceptionalities, have multimedia resource materials available. Also focus on visual literacy, displaying knowledge visually (with graphs, labelled drawings, etc.) instead of text heavy pop-up books. Another option is to let them select text from a hand-out and cut and paste passages in their pop-up book.

English Language Learners can be provided with a template to facilitate their work.

Special needs children would be assisted during the research phase of the project in finding and recording key information.

Students with fine motor skills impairment can use a computer to type their text instead of hand-writing it. They can be assisted by a classmate or a teacher in creating the pop-up pages.

For students who finish early, get them to describe the interactions between two organ systems through a song/poem (working alone or in pairs).

Materials and resources

Students will need to research information, especially at the start of their project. There are a few options available to teachers leading this culminating task. For example, the teacher can visit the school library and the public library ahead of time and borrow books that will remain in the classroom for the duration of the project; the teacher can incorporate a visit to the school library as one of the research periods; the teacher can book the computer laboratory during one research period to allow students to do online research. To accommodate the needs of students, teacher should ensure they have access to a variety of resources such as books, CD-ROMs and other multimedia resources. They should also ensure the resources available are geared towards a variety of readers, with various degrees of reading difficulty. Please see appendix D for a list of suggested resources for students.

It is also recommended that the teacher displays or reads pop-up books to students; these books could also be found at a library.

To create their pop-up book, students will need consumables such as:

* Paper
* Pencils/erasers
* Construction paper
* Scissors
* Staplers/staples
* Coloured markers/pencils
* Tape/glue
* Classroom computers (if needed for accommodations)

Students will also need instructions on how to create pop-up books (see appendix E).

Appendix A

Assessment tools – Pop-up Book Rubric

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Pop-Up Book Rubric**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria** | **Level 1** | **Level 2** | **Level 3** | **Level 4** |
| **Understanding of basic concepts** | Limited or no understanding of how organs or components of body systems in the human body work and interact with other components | Some understanding of how organs or components of body systems in the human body work and interact with other components | Considerable understanding of how organs or components of body systems in the human body work and interact with other components | Thorough understanding of how organs or components of body systems in the human body work and interact with other components |
| **Inquiry and design skills** | Uses at least one pop-up mechanism  No pop-up acts as a model that demonstrates how components of the system work and interact with other components | Uses at least two pop-up mechanisms  One pop-up acts as a model that inefficiently demonstrates how components of the system work and interact with other components | Uses at least three pop-up mechanisms  One pop-up acts as a model that demonstrates how components of the system work and interact with other components | Uses at least four pop-up mechanisms  At least one pop-up acts as a model that efficiently demonstrates how components of the system work and interact with other components |
| **Communication** | Rarely uses appropriate science and technology terminology | Sometimes uses appropriate science and technology terminology | Usually uses appropriate science and technology terminology | Consistently uses appropriate science and technology terminology |
| **Analysis and Interpretation** | Shows little understanding of connections between the effects of social and environmental factors on human health, and what can be done about it to stay healthy  Shows little understanding of how one disease or one problem that can affect an organ system | Shows some understanding of connections between the effects of social and environmental factors on human health, and what can be done about it to stay healthy  Shows some understanding of how one disease or one problem that can affect an organ system | Shows understanding of connections between the effects of social and environmental factors on human health, and what can be done about it to stay healthy  Shows understanding of how one disease or one problem that can affect an organ system | Shows considerable understanding of connections between the effects of social and environmental factors on human health, and what can be done about it to stay healthy  Shows considerable understanding of how one disease or one problem that can affect an organ system |

Appendix B

Assessment tools – Peer Assessment Checklist

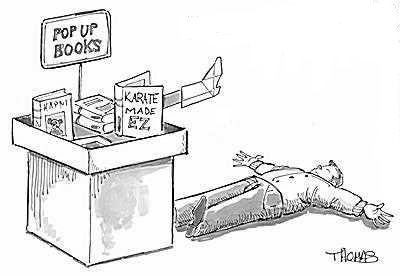
**Peer Assessment Checklist**

Author of the book: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Draft copy assessed by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use this checklist to assess the draft copy of a classmate’s pop-up book

* It is clear which organ system the book is about
* All the parts of the organ system have been identified
* We know what all the parts of the system do
* We clearly understand why we need this system for
* It is explained how this system works with another organ system in the body
* One disease or one problem that affects the organ system has been mentioned
* It is clear what we can do to keep this organ system healthy
* It discusses a habit humans have or something present in their environment and how it positively or negatively affects the chosen organ system
* There is a reference page with a list of the resources that were used (books, websites, other)
* There are no spelling mistakes



Appendix C

Assessment tools – Self-Assessment Sheet

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Self-Assessment Sheet**

Please circle the answer that best describes how you worked.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Background Information** | | | | | |
| I had prior knowledge about organ systems | Way too much | Too much | About right | Too little | Way to little |
| I am able to identify organ systems of the human body and describe their functions | Strongly Agree | Agree | On the fence | Disagree | Strongly Disagree |
| I understood the expectations of the assignment | Almost always | Often | Sometimes | Seldom | Never |
| **Research** | | | | | |
| I used various resources including books, the internet and other classroom resources to collect information about my organ system | Very good | Good | Fair | Poor | Very poor |
| I asked questions if I did not understand what to do | Very Often | Often | Sometimes | Once or Twice | Never |
| **Time Management** | | | | | |
| I came prepared to work | Most of the time | Some of the time | Seldom | Very seldom | Hardly ever |
| I used class time effectively | Strongly Agree | Agree | On the fence | Disagree | Strongly Disagree |
| I worked independently and did not need constant assistance | Most of the time | Often | Sometimes | Seldom | Never |
| **Presentation** | | | | | |
| I am happy with the final product | Completely Satisfied | Very Satisfied | Fairly Satisfied | Somewhat Dissatisfied | Very Dissatisfied |

Appendix D

List of resources

**Books**

Biesty, Stephen, Platt, Richard. *Stephen Biesty's incredible body*. DK Publishing, 1998.

Burstein, John. *The Amazing Circulatory System: How Does my Heart Work?* Crabtree Publishing Company, 2009.

Burstein, John. *The Astounding Nervous System: How Does My Brain Work?* Crabtree Publishing Company, 2009.

Burstein, John. *The Dynamic Digestive System: How Does my Stomach Work?* Crabtree Publishing Company, 2009.

Burstein, John. *The Mighty Muscular and Skeletal Systems: How Do My Muscles and Bones Work?* Crabtree Publishing Company, 2009.

Burstein, John. *The Remarkable Respiratory System: How Do My Lungs Work?* Crabtree Publishing Company, 2009.

Cromwell, Sharon. *Why Can't I Breathe Underwater? : And Other Questions About the Respiratory System*. Heinemann Library, 1998.

Cromwell, Sharon. *Why Do My Feet Fall Asleep? : And Other Questions About the Circulatory System*. Heinemann Library, 1998.

Cromwell, Sharon. *Why Does my Tummy Rumble When I'm Hungry? : And Other Questions About the Digestive System*. Heinemann Library, 1998.

Gold, John Coopersmith. *The Circulatory and Lymphatic Systems*. Enslow Publishers,2004

Gold, Susan Dudley. *The Digestive and Excretory Systems*. Enslow Publishers,2004.

Gold, Susan Dudley. *The Respiratory System*. Enslow Publishers,2004.

Graham, Nick. *The Human Body.* Ladybird Books,1996.

Irvine, Joan. *How to Make Pop Ups*. Kids Can Press, 1997.

Johnson, Jinny. *Skeleton : our body's framework*. Grolier Educational, 1998.

Johnson, Paul. *Pop-Up Paper Engineering.* The Falmer Press, 1992.

Swanson, Diane. *Burp! : The Most Interesting Book You'll Ever Read About Eating*. Kids Can Press, 2001.

Walker, Richard. *DK Guide to the Human Body*. Dorling Kindersley, 2001.

Walker, Richard. *Muscles: How We Move and Exercise*. Grolier Educational, 1998.

Walker, Richard. *The Human Machine: An Owner's Guide to the Body.* Oxford University Press, 2008.

**Web resources/games for students**

1. <http://www.sciencekids.co.nz/gamesactivities/healthgrowth.html>
2. <http://www.bbc.co.uk/science/humanbody/>
3. <http://www.lung.ca/children/grades4_6/respiratory/index.html>
4. http://yucky.discovery.com/flash/body/

**Web resources for teachers**

1. <http://www.torontozoo.com/pdfs/TorontoZoo-Grade5-Workshop.pdf>
2. <http://faculty.washington.edu/chudler/neurok.html>
3. <http://www.smoke-fx.com/index.html>
4. <http://www.ash.org.nz/site_resources/library/Health_promotion/Schools/Smoking_bomb_kit_lesson_plan.pdf>
5. <http://www.edupics.com/coloring-pages-human-body-c130.html>
6. http://robertsabuda.com/popmakesimple.asp

Appendix E

Pop-Up Instruction Sheets